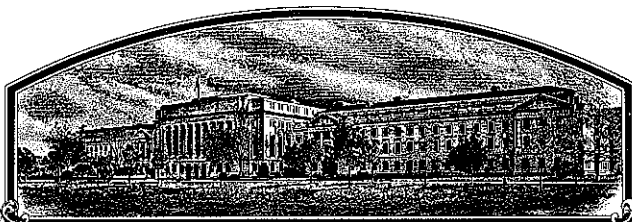


No.



8900123

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**AgriPro Biosciences Inc.**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Waco'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 30th day of November in the year of our Lord one thousand nine hundred and ninety-three.

Attest.

*Kenneth H. Evans*

Commissioner

Plant Variety Protection Office  
Agricultural Marketing Service

*Mike Egan*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

## APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Agripro Biosciences Inc.		2. TEMPORARY DESIGNATION W83-253	3. VARIETY NAME WACO
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 6700 Antioch Shawnee Mission, Kansas 66204		5. PHONE (Include area code) 913-384-4940 (KS) 303-532-3721 (CO)	FOR OFFICIAL USE ONLY PVPO NUMBER 8900123
6. GENUS AND SPECIES NAME Triticum aestivum	7. FAMILY NAME (Botanical) Gramineae		FILING DATE Mar. 20, 1989 TIME <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. KIND NAME Hard Red Winter Wheat	9. DATE OF DETERMINATION 1) 1983 July 1985 2) 1986 AAA 25 Mar 1993 per letter		FEE RECEIVED AMOUNT FOR FILING \$ 1800.00 DATE Mar. 20, 1989 AMOUNT FOR CERTIFICATE \$ 200.00 DATE Nov. 16, 1993
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			12. DATE OF INCORPORATION February 8, 1989
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware			13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS R.E. Heiner 6700 Antioch Shawnee Mission, KS 66204 913-384-4940 OR R. Bruns or C. Bruns P.O. Box 30 Berthoud, CO 80513 PHONE (Include area code): 303-532-3721
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED			
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)			
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.			
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)			
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.			
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. Exhibit F. Quality & Agronomics Data			
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input checked="" type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input type="checkbox"/> No			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> Foundation <input checked="" type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No			
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT RE Heiner		DATE 3-14-89	
SIGNATURE OF APPLICANT		DATE	

**EXHIBIT A.****ORIGIN AND BREEDING HISTORY**

Waco originated from the cross W77-355/MN70113 made in 1980. Waco was observed regionally as an F4 plant row in 1982. Waco was tested in preliminary yield trials in 1983 and designated experimental number W83-253. Waco has been tested in AgriPro replicated trials representing a fairly broad area of the Hard Red Winter Wheat region from 1986 thru 1988. Waco was entered in limited 1990 university and public trials primarily in the state of Texas.

In 1985, 164 head-rows were grown in Berthoud, Colorado. One hundred thirty one of these initial head-rows were selected to form a .5 acre increase in 1986, which produced 960 pounds of breeder seed. In 1987, 1534 bushels of foundation seed was produced. In the fall of 1988 registered production was grown in Texas.

Waco has been uniform and stable since 1988. Less than 0.5% of the plants were rogued from the foundation field in 1987. The majority of the rogued variant plants consisted of approximately 90% taller (three to ten centimeters) wheat plants. Up to 1% total variant plants may be encountered in subsequent generations.

## EXHIBIT B.

## NOVELTY STATEMENT

Waco is most similar to the hard red winter wheats HR 53, HR 64 and Mustang. However, it can be distinguished by the following morphological characteristics:

- Waco has a significantly longer beak than either HR 53 or Mustang, (see statistical data on the following pages 1 & 2).
- Waco has a blue-green plant color at boot. HR 64 has a green plant color at boot.
- Waco has an oblique shoulder shape. Mustang has a rounded shoulder shape.

← R4S 122B ← AAA 24 Sent 1993 per letter → R4S 137C

page 1.

## ANOVA TABLE FOR BEAK LENGTH

WACO VS. HR 53

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>
TOTAL	49	241.372	
VAR	1	43.618	43.61771
ERROR	48	197.755	4.11989

F-TEST= 10.587\*\*

CV= 4.352

LSD (5%)= 0.230

MEANS FOR EACH VARIETY

WACO= 7.4mm

HR 53= 5.5mm

\*\*The difference in means of beak length are significantly different at the 1% probability level.

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page 2.

ANOVA TABLE FOR BEAK LENGTH  
WACO VS. MUSTANG

SOURCE	DF	SS	MS
TOTAL	49	243.725	
VAR	1	65.666	65.66644
ERROR	48	178.058	3.70955

F-TEST= 17.702\*\*

CV= 4.379

LSD(5%)= 0.218

MEANS FOR EACH VARIETY

WACO= 7.4mm

MUSTANG= 5.0mm

\*\*The difference in means of beak length are significantly different at the 1% probability level.

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'Waco'

8900-123

FORM GR-470-5 (REVERSE)

## 11. HEAD:

Density: 1 = LAX 2 = DENSE 3 = MIDDENSE  Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) \_\_\_\_\_  
 Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED  
 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify) \_\_\_\_\_  
 CM. LENGTH  MM. WIDTH

## 12. GLUMES AT MATURITY:

Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)  Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)  
 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE  Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

## 13. COLEOPTILE COLOR:

1 = WHITE 2 = RED 3 = PURPLE

## 14. SEEDLING ANTHOCYANIN:

1 = ABSENT 2 = PRESENT

## 15. JUVENILE PLANT GROWTH HABIT:

1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

## 16. SEED:

Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL  Check: 1 = ROUNDED 2 = ANGULAR  
 Brush: 1 = SHORT 2 = midlong 3 = LONG  Brush: 1 = NOT COLLARED 2 = COLLARED  
 Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK  
 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) \_\_\_\_\_  
 MM. LENGTH  MM. WIDTH  GM. PER 1000 SEEDS

## 17. SEED CREASE:

Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'  
 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

## 18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3 = Moderately Susceptible 4 = Moderately Resistant

STEM RUST (Races) field races  LEAF RUST (Races) field races  STRIPE RUST (Races)  LOOSE SMUT  
 POWDERY MILDEW  BUNT  OTHER (Specify) \_\_\_\_\_

## 19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3 = Moderately Susceptible 4 = Moderately Resistant

SAWFLY  APHID (Bydv.)  GREEN BUG  CEREAL LEAF BEETLE  
 OTHER (Specify) \_\_\_\_\_ HESSIAN FLY RACES:  GP  A  B  C  
 D  E  F  G

## 20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	HR 53	Seed size	HR 53
Leaf size	HR 53	Seed shape	HR 53
Leaf color	HR 53	Coleoptile elongation	HR 53
Leaf carriage	HR 53	Seedling pigmentation	HR 53

## INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.T. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Their Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.(b) T.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 23 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

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## EXHIBIT D.

## ADDITIONAL BOTANICAL DESCRIPTION OF WACO

Waco is a hard red winter wheat that was bred and developed by Agripro Biosciences Inc.

Waco is an intermediate height semidwarf variety with very early maturity. Milling and baking properties are very good.

Juvenile plant growth habit is semi-erect to erect. Plant color at boot is blue-green with a recurved, twisted flag leaf. Head shape is tapering, middense and awned. Head color is white at maturity. Glumes are glabrous, short in length and narrow in width with oblique shoulders and acuminate beaks. Seed shape is ovate with a midlong brush length and rounded cheeks. Seed crease is narrow and shallow.

Waco is adapted to the north-central and northeastern portions of Texas. Secondary area of adaptation is southwestern Oklahoma and the high plains of Texas.

EXHIBIT E.

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

Agripro Biosciences Inc. is the applicant for protection in this case being:

- a) The incorporated business (registered in Delaware) for and within which regular employees have bred the named variety.
- b) The proprietary owner and intending commercial user of the variety.

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EXHIBIT F.

QUALITY AND AGRONOMIC DATA

Quality Data . . . . .page 1.

Agronomic Data . . . . .page 2.

Height and Maturity Data . . . . .page 3.

AGRIPRO WHEAT  
HARD RED WINTER WHEAT

YEAR: 1988

		FLOUR/WHEAT QUALITY							BAKING QUALITY					
YEAR	VARIETY OR LINE	LOC	WHT PROT	FLR PROT	HRD	FLR YLD	ASH	MIX TOL	ABS	MIX TIME	LOAF VOL	CRUMB		
			14%mb	14%mb		%		R	%	min	cc	R	R	COL
88	WACO	SK	15.8	15.0	66	62.5	.420	9	65.0	3.25	1290	6	3	2
88	WACO	SK	15.4	14.7	72	61.4	.454	7	65.0	3.25	1160	4	4	3
88	WACO	NO	13.2	12.0	59	66.5	.405	5	63.0	3.50	1240	2	2	2
88	WACO	NO	13.6	12.6	65	64.4	.463	3	65.0	3.25	1240	6	4	3
87	WACO	WK	13.3	12.2	56	67.4	.406	7	63.0	3.00	1100	5	3	3
87	WACO	GI	14.8	13.3	67	66.1	.000	5	65.0	3.00	1170	6	3	3
86	WACO	NO	13.8	11.7		64.7	.397	2	65.0	3.30	1025	2	2	2
86	WACO	WK	12.4	11.1		66.0	.411	3	65.0	3.50	950	3	2	2
86	WACO	GI	12.4	11.0		70.1	.372	4	65.0	2.30	950	3	1	1
85	WACO	TI	12.1	11.1		68.7	.408	3	66.0	2.30	940	2	1	1
85	WACO	SK	13.2	12.1		70.8	.359	3	66.0	2.80	1000	2	1	1
85	WACO	BB	14.0	13.1		67.9	.392	2	66.0	2.80	1000	4	2	1
85	WACO	GK	12.9	11.4		67.9	.437	3	65.0	3.00	930	2	2	2
84	WACO	SO	13.0	12.1		73.3	.000	2	65.0	3.30	990	2	1	2
AVERAGE			13.6	12.3	64	67.0	.430	4.14	64.9	3.04	1070	3.5	2.2	2.0
88	HAWK	SK	15.1	14.3	63	61.8	.508	2	62.0	5.00	1180	3	3	3
88	HAWK	SK	14.0	13.1	70	62.9	.439	3	61.0	4.50	910	4	4	3
88	HAWK	NO	12.7	11.4	60	66.4	.436	1	61.0	4.25	1040	3	4	3
88	HAWK	NO	13.1	12.0	61	64.8	.456	2	62.0	4.75	1050	3	2	2
87	HAWK	WK	11.9	10.4	54	67.4	.442	5	62.0	3.50	890	3	3	3
87	HAWK	GI	14.3	13.2	62	65.3	.000	3	63.0	3.75	1030	4	3	3
86	HAWK	NO	12.2	10.7		67.9	.505	3	62.0	4.80	940	2	3	2
86	HAWK	WK	11.5	9.9		64.3	.443	5	63.0	4.80	870	3	3	2
86	HAWK	GI	11.3	9.8		70.4	.442	2	64.0	3.50	840	3	3	2
85	HAWK	TI	11.7	11.0		69.5	.543	4	63.0	2.80	800	6	5	4
85	HAWK	SK	12.7	11.5		70.2	.436	3	63.0	3.30	920	2	2	2
85	HAWK	BB	13.0	12.1		70.4	.430	2	65.0	3.00	890	2	2	2
85	HAWK	GK	11.8	10.3		70.3	.482	4	62.0	4.00	850	2	3	2
84	HAWK	SO	11.8	10.3		74.4	.000	3	62.0	4.50	910	2	2	2
AVERAGE			12.7	11.4	64	67.6	.460	3.00	62.5	4.03	937	3.0	3.0	2.5
R=RATINGS			1-2=EXCELLENT		3-4=GOOD		5=ACCEPTABLE		6-7=QUESTIONABLE		8-9=UNACCEPTABLE			

## 1986-1987 YIELD AND TEST WEIGHT SUMMARY

## 1986-1987 TEST AVERAGES

VARIETY	REGION TESTED	NO.OF TESTS	YIELD (bu/ac)	TEST WT. (lb/bu)
Waco	TX	6	39.3	57.7
MIT		6	37.0	56.9
Waco	TX	6	39.3	57.7
Chisholm		6	37.6	58.5
Waco	TX	6	39.3	57.7
NK-812		6	33.0	54.3
Waco	TX	6	39.3	57.7
Collin		6	37.8	57.5
Waco	TX & OK	8	42.5	57.9
TAM 107		8	39.1	56.1
Waco	TX,OK,KS	18	49.9	59.0
TAM 105		18	43.2	55.7
Waco	TX	6	39.3	57.7
Mustang		6	37.2	56.8
Waco	TX,OK,KS	23	52.4	58.7
Hawk		23	48.0	56.9

RELATIVE RANKINGS OF WACO AND FOUR OTHER HRWW VARIETIES  
FOR HEIGHT AND MATURITY - 1988 SUMMARY

<u>VARIETY</u>	<u>HEIGHT</u>	<u>MATURITY</u>
Waco	4	1
Victory	4	4
Mustang	3	3
Siouxland	6	5
Mesa	2	2

These rankings are based upon a scale of 1 thru 9, where 1 is very short or very early and 9 is very late or very tall.